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10/501,489	02/14/2005	Ryousuke Yamamoto	0310543	2516
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PILLSBURY WINTHROP SHAW PITTMAN LLP			EXAMINER	
P.O BOX 10500			GEOGHEGAN, CHRISTOPHER D	
McLean, VA 22102			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/501,489

Applicant(s)

YAMAMOTO ET AL.

Examiner

Christopher D. Geoghegan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2006.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-13, 18 and 19 is/are rejected.
7) ☒ Claim(s) 14-17 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 13 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/28/2006.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 2 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The recitation, "wherein the alarming device is caused to stop giving an alarming signal after all the doors are opened," is one of intended use and lends no further structural limitation from the claim on which it depends.
2. Claim 5 is objected to because of the following informalities: the semicolon ";" should be changed to a colon -- : --. Appropriate correction is required.
3. Claim 11 objected to because of the following informalities: The phrase "wherein a described length" should be rewritten to read -- wherein a prescribed length -- to keep with the terminology of the claim from which it depends. Appropriate correction is required.
4. Claim 18 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim merely recites the limitations of its parent claim in an active voice without adding any further structure.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation, "a controller for causing the alarming device to stop giving an alarming signal after a door of a storage compartment into which the cold air flows after the damper is opened" is indefinite in that it is unclear as to whether the alarming device is stopped when the door of a storage compartment into which the cold air flows is opened, or whether the alarming device is stopped after the damper is opened. For the purposes of furthering prosecution and applying art, claim 3 will be interpreted as the stopping of the alarming device requiring the door of the storage compartment into which the cold air flows to be opened.

7. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim is generally narrative and indefinite, failing to conform with current U.S. practice. It appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors. For the purposes of furthering prosecution and applying art, claim 7 will be interpreted as requiring one of two things after the door is opened and the alarming device is stopped: (1) the alarming device is initiated again when the door is closed before a minimum time

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has elapsed that the door must remain open, or (2) the alarming device remains OFF when the door remains open after the minimum time has elapsed that the door must remain open.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 1, 2, 6, 7, 10-12, 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komai (JP 2002-005548 A) and in view of Topper et al. (US 6,205,800 B1).

In regard to claim 1:

Komai teaches a household refrigerator in which a combustible refrigerant is used, having detecting means for detecting a refrigerant leak within the refrigeration system [¶0001; ¶0017]. Komai also teaches that the refrigerator may have an alarm capable of "giving an alarming signal warning against the refrigerant leak when the refrigerant leak is detected by the detector" [¶0032; ¶0042]. The recitation, "a controller for causing the alarming device to stop giving an alarming signal after a door of a storage compartment is opened," is one of intended use, and as it lends no further structural limitation to the claimed invention, it carries little patentable weight. Komai does, however, disclose a

controller (6) capable of "causing the alarming device to stop giving an alarming signal" [Drawing 1, illustrating an electrical connection between controller (6) and abnormality information equipment (10)].

Though Komai does not expressly teach the stopping of an alarming signal upon the opening of a door of a storage compartment, Topper et al. discloses a controller (40) that activates an alarm to audibly/visibly alert a person that the door (54) has been open for a given period of time, based on the door open signal of door sensor (56) [column 4, lines 20-26]. The controller merely receives the open/closed information from the door sensor, determines whether the door has been open longer than a predetermined time period, and supplies a signal to power the alarm if the time period has been exceeded. One of ordinary skill in the art at the time the invention was made would understand that the controller (40) of Topper et al. could easily be configured (by way of its programming) to terminate the alarm after a predetermined time of zero after the door is opened, thus essentially terminating the alarm when the door is opened. The controller of Komai as explained above, when operated with the aforementioned teaching of Topper et al. following the onset of an alarm indicating a refrigerant leak, is capable of performing the recitation of intended use for the claimed controller to stop an alarm signal when the door is opened. It would have been obvious to one skilled in the art at the time the invention was made to use a controller that is capable of sounding an alarm as a function of the door open/close status, as taught by Topper et al., in the refrigerator of Komai in

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order to terminate an alarm upon the diffusion of refrigerant gas from the refrigerator compartment into the surrounding air by way of the opening of a refrigerator door.

While Komai does teach a refrigeration cycle with a compressor (8), Komai is silent on the specific components of the refrigeration cycle. It is well known in the art, however, as evidenced by Hirahara et al. (US 5,531,080), to employ a condenser (2), a capillary tube (3), an evaporator (4), and an accumulator (8) or oil separator (20) within a refrigeration system [column 12, lines 3-16; column 13, line 57 - column 14, line 10]. It would have been obvious to one skilled in the art at the time the invention was made to include the refrigeration components, as taught by Hirahara et al., in the refrigeration system of Komai in order to construct a working refrigeration system.

In regard to claim 2:

Komai and Topper et al. disclose a household refrigerator with a controller capable of causing the alarming device to stop giving an alarming signal after a door of a storage compartment is opened [see 35 U.S.C. 103(a) rejection to claim 1 above]. The refrigerator disclosed by Topper et al. has only one door (54), which is coupled to the aforementioned door sensor (56) [column 4, lines 11-26]. It is clear by this disclosure, in light of the 35 U.S.C. 103(a) rejection to claim 1 above, that the alarming device is capable of being "caused to stop giving an alarming signal after all the doors are opened."

In regard to claim 6:

The recitation, "wherein the alarming device is caused to stop giving an alarming signal after the door is left open longer than a prescribed length of time," is one of intended use, and as it lends no further structural limitation to the claimed invention, it is given little patentable weight. The alarming device and controller of Komai, in conjunction with the controller operation teaching and door sensor of Topper et al., are capable of performing such an intended use [see 35 U.S.C. 103(a) rejection to claims 1 and 2 above].

In regard to claim 7:

Given the explanation of the refrigerator leakage detector and alarming device as set forth in the 35 U.S.C. 103(a) rejection to claim 1 above, it would follow that when the alarming device is stopped upon the opening of the door, the alarming device would remain OFF when the door remains open after the minimum time has elapsed that the door must remain open. Therefore, Komai and Topper et al. implicitly teach the limitation, "wherein, after the door is opened and the alarming device is caused to stop giving an alarming signal, the alarming device is caused to give an alarming signal again in the case that the door is closed while in the state that time for which the door has been left open is shorter than a prescribed length of time, or the alarming device is caused to continue giving no alarming signal in the case that the door is opened while in the state that time for which the door has been left open is longer than a prescribed length of time."

In regard to claim 10:

Komai and Topper et al. render obvious the limitations, "a refrigeration cycle which a compressor, a condenser, a capillary, an evaporator, and an accumulator are connected to, and in which an inflammable refrigerant is included" and "a detector for detecting a leak of the refrigerant" [see 35 U.S.C. 103(a) rejection to claim 1 above]. The alarming device of Komai and Topper et al. is also capable of "giving an alarming signal warning against the refrigerant leak after a prescribed length of time has passed in the case that the refrigerant leak is detected by the detector," as Topper et al. describes an alarm that supplies an alarming signal after a predetermined period of time [see 35 U.S.C. 103(a) rejection to claim 1 above].

In regard to claim 11:

The limitation, "wherein a described length of time is defined as a time which it takes for the concentration of the refrigerant to come to be lower than the concentration of inflammation while the leaked refrigerant diffuses out of a compartment" lends no further structural limitation to the claimed invention, and is thus given little patentable weight. As such, the controller of Topper et al. is capable of being programmed with such a described length of time, as explained in the 35 U.S.C. 103(a) rejection to claim 1 above. It would have been obvious to one skilled in the art at the time the invention was made to program the controller of Komai and Topper et al. to cease the operation of the alarm after a time period indicative of refrigeration concentration lower than inflammation in order to provide a safer refrigerator leak detection system.

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In regard to claim 12:

Komai and Topper et al. render obvious the limitations, "a refrigeration cycle which a compressor, a condenser, a capillary, an evaporator, and an accumulator are connected to, and in which an inflammable refrigerant is included," and "a detector for detecting a leak of the refrigerant" [see 35 U.S.C. 103(a) rejection to claim 1 above]. Topper et al. discloses an alarming device that is controlled by a controller, which operates as a function of preprogrammed timers and ON/OFF commands. It is clear by the explanation of the control unit controlling the alarm of Topper et al. in the 35 U.S.C. 103(a) rejection to claim 1 above, that one of ordinary skill in the art would recognize the operability of the controller to perform the intended use function of controlling "an alarming device for giving an alarming signal warning against the refrigerant leak when a refrigerant leak is no longer detected after the refrigerant diffuses in the case that the refrigerant leak is detected by the detector," by simply changing the controller's operational parameters.

In regard to claim 18:

The limitation "wherein the detector detects that a refrigerant has leaked, and the alarming device gives an alarming signal informing that the refrigerant has leaked" is taught by Komai [see 35 U.S.C. 103(a) rejection to claim 1 above].

In regard to claim 19:

Komai teaches the use of a current detector to detect the occurrence of a refrigerant leak, and Applicant discloses "a refrigerant leak may be detected in

advance through a fluctuation in the pressure, duties, voltage or the like of the compressor.” It has already been stated in the 35 U.S.C. 103(a) rejection to claim 1 above that the alarming device provides a signal indicative of a refrigerant leak based upon the signal provided by the controller, which is dependent on the current detector of Komai. Komai and Topper et al. thus meet the limitation, “wherein the detector detects in advance that a refrigerant is to leak, and the alarming device is caused to give an alarming signal informing that the refrigerant is to leak.”

10. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komai and Topper et al. and Jeong et al. (US 5,678,413). Komai and Topper et al. teach the limitations, “a refrigeration cycle which a compressor, a condenser, a capillary, an evaporator, and an accumulator are connected to, and in which an inflammable refrigerant is included”, “a detector for detecting a leak of a refrigerant”, and “an alarming device for giving an alarming signal warning against the refrigerant leak when the refrigerant leak is detected by the detector” [see 35 U.S.C. 103(a) rejection to claim 1 above]. However, Komai and Topper et al. do not expressly teach the use of a duct and damper system for delivering cold air to the freezer and refrigerator compartments. Jeong et al., on the other hand, discloses that it is well known in the art for a refrigerator to employ “a duct for sending cold air which has been cooled by the evaporator to at least the storage compartments including a refrigerator compartment and a freezer” and “a damper, which is arranged in the duct, for adjusting an amount of the cold air which is

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being sent" [column 1, lines 34-39; Fig. 1, (15a), (19), respectively]. It would have been obvious to one skilled in the art at the time the invention was made to incorporate the duct and damper system taught by Jeong et al. into the refrigerator of Komai and Topper et al. in order to guide the cool air and to control the amount of the cool air provided to the refrigeration compartment.

Because the aforementioned damper distributes cold air into the refrigeration compartment, it would have been obvious to one skilled in the art at the time the invention was made that the controller that causes the alarming device to stop giving an alarming signal upon the opening of a compartment door, as taught by the combination of teachings of Komai and Topper et al. [see 35 U.S.C. 103(a) rejection to claim 1 above], would satisfy the limitation, "a controller for causing the alarming device to stop giving an alarming signal after a door of a storage compartment into which the cold air flows after the damper is opened."

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komai and Topper et al. as applied to claim 1 above, and further in view of Yokoe (JP 2000-220935 A). While the detector of Komai does not detect "a refrigerant leak in the compartment," Yokoe discloses a gas leakage detection sensor (30) located near the evaporator (8) within the compartment of the refrigerator to detect a refrigerant leak within the compartment [¶0063; Fig. 3]. It would have been obvious to one skilled in the art at the time the invention was made to employ a gas leakage detection sensor within the compartment of a refrigerator, as taught by Yokoe, in the refrigerator of Komai and

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Topper et al. in order to detect a gas leakage within the refrigerator compartment and reduce the risk of explosion.

12. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. (US 6,497,113 B1), Kino et al. (JP 2000-121209 A), Komai, and Topper et al. Yamada et al. teaches the limitations "a refrigerating space and a freezing space which are formed in a way that the storage space in the main body of the refrigerator is sectioned off by a partition wall" [Abstract], and "a refrigeration cycle... [wherein] the refrigerating space and the freezing space are capable of being controlled independently for refrigeration" [Abstract]. Though Yamada et al. does not disclose the entire refrigeration cycle as claimed by applicant, Hirahara et al. shows that it is well known in the art that a typical refrigeration cycle can include "a compressor, a condenser, capillaries and evaporators for the refrigerating space and the freezing space, and an accumulator," as well as an inflammable refrigerant [see 35 U.S.C. 103(a) rejection to claim 1 above].

Though Yamada et al. is silent on the issues, Kino et al. teaches the use of a detector in both the refrigerating and the freezing space for detecting a refrigerant leak [Fig. 3, (49a), (49b)]. It would have been obvious to one skilled in the art at the time the invention was made to include the refrigerant leakage detectors of Kino et al. into the refrigerator of Yamada et al. in order to detect a refrigerant leak and prevent a dangerous environment.

Komai and Topper et al. disclose the limitations, "an alarming device for giving an alarming signal warning against the refrigerant leak when the refrigerant leak is detected by the detector," and "a controller for causing the alarming device to stop giving an alarming signal after a door of a compartment in one of the refrigerating space and the freezing compartment in which the refrigerant leak is detected by the detector is opened" [see 35 U.S.C. 103(a) rejection to claim 1 above]. It would have been obvious to one skilled in the art at the time the invention was made to include the alarming device and the controller of Komai and Topper et al. into the refrigerator of Yamada et al. and Kino et al. in order to alert the user of a refrigerant leak and to subsequently terminate an alarm upon the diffusion of refrigerant gas from the refrigerator compartment into the surrounding air by way of the opening of a refrigerator door.

13. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komai and Topper et al. as applied to claim 1 above, and further in view of Blackman. Komai and Topper et al. fail to teach the limitations, "an auxiliary power supply for causing the alarming device to continue giving an alarming signal in the case that the power supply is turned off," and "wherein, in the case that the power supply is turned off and again on while the alarming device is caused to be giving an alarming signal, the alarming device is caused to resume giving an alarming signal." Blackman discloses, however, an alarm clock with a battery back-up system (210) for providing to a clock and alarm during a power blackout [column 4, lines 45-50]. The battery back-up system (210) provides power to the alarm switch (182) and clock (146) during a power blackout

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to prevent the loss of time on the digital clock display (146), indicating that there is a continuous power supply to the electrical components of the alarm clock on the crossover from an alternating current power supply to the battery back-up system (210) [column 7, lines 52-64]. This means that the alarm, as well as the clock, has a constant source of power even if the power source is turned off, and would thus mean that the alarm clock of Blackman is capable of continuously operating an alarm via the battery back-up system (210) upon the switching off of the power source.

In regard to claim 8:

Blackman recites all the limitations of the claim as discussed above. It would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Blackman to use a battery back-up system in the refrigerator of Komai and Topper et al. in order to prevent the loss of power to the alarming device.

In regard to claim 9:

As discussed above, Blackman discloses a battery back-up system that powers the alarm, and thus keeps the alarm schedule intact. Therefore, when the power supply is turned off and on again while the alarming device is caused to be giving an alarming signal, the alarm resumes operation on the power supply and give an alarm signal. It would have been obvious to one skilled in the art at the time the invention was made to include the battery back-up system of Blackman in the alarming device of Komai and Topper et al. in order to provide

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an alarm which is capable of operating with or without an alternating power source.

14. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komai and Topper et al. as applied to claim 10 above, and further in view of Yokoe. Komai and Topper et al. do not expressly teach the taking of action between the detection of a refrigerant leak and the alarming signal, but Yokoe discloses a system wherein a door-opening means forcibly opens the door when a gas leakage is detected within the storage compartment and initiates a forced exhausting means to expel the refrigerant from the compartment, reducing concentration of refrigerant in the air by diffusing it into the surrounding air [¶0028-¶0033]. As mentioned previously, Topper et al. discloses an alarm system that is capable of being initiated after a predetermined length of time [see 35 U.S.C. 103(a) rejection to claim 1 above]. One skilled in the art at the time of the invention would easily see that the diffusing means of Yokoe would be initiated at the time of refrigerant leak detection, and that the activation of the alarming device of Komai and Topper et al. could easily be delayed for a predetermined time after the refrigerant leak detection. It would have been obvious to one skilled in the art at the time the invention was made to use the teaching of Yokoe to take immediate action following a refrigerant leak, with the delayed alarm of Komai and Topper et al. in order to diffuse the refrigerant as quickly as possible before alerting the user of a refrigerant leak.

Allowable Subject Matter

15. Claims 14-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: Claims 14 and 16 are directed to a case wherein the alarm record is placed into the memory device when the power supply is turned on, and the alarm signal is subsequently given via the alarm device when the power supply is turned on. The prior art neither anticipates nor renders this limitation obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher D. Geoghegan whose telephone number is 571-270-1993. The examiner can normally be reached on Monday - Thursday, 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frantz Jules can be reached on 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CDG 7/19/2007

FRANTZ JULES
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Frantz', with a long horizontal flourish extending to the right.